

李红玲,王马魁,任力,陈维,李春岩.运动训练对大鼠出血性脑损伤BDNF基因及其蛋白表达的影响[J].中国康复医学杂志,2008,(9):782-785

运动训练对大鼠出血性脑损伤BDNF基因及其蛋白表达的影响 [点此下载全文](#)

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基金项目:

DOI:

摘要点击次数: 100

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摘要:

目的: 观察运动训练对脑出血(ICH)大鼠脑源性神经营养因子(BDNF)及其蛋白表达的影响。方法: 实验动物用健康雄性SD大鼠155只。其中120只随机分为3组: 实验组(出血后运动n=40)、对照组(出血后不运动 n=40)、假手术组(无出血不运动n=40只)。各组又分为术后第7天、第14天、第21天、第28天共4个时相点, 每个时相点5只用于免疫组化检测, 5只用于RT-PCR检测。实验组大鼠于术后第72h开始跑笼训练, 其余大鼠在标准笼内自由活动。另外35只随机分为脑出血后第6小时、第12小时、第24小时、第48小时、第72小时, 假手术和正常组, 每组5只, 用于免疫组化和RT-PCR检测。结果: ①免疫组化结果: BDNF阳性细胞表达为细胞浆着棕黄色, 阳性细胞主要分布于血肿周围和大脑皮质的神经元。脑出血后第12h BDNF曾一度升高, 第72h基本恢复正常。实验组随运动训练时间延长表达有上调趋势, 第28d达高峰, 较对照组相比有差异有显著性(P<0.05), 实验组和对照组与假手术组相比差异有显著性(P<0.05)。②RT-PCR 结果: 实验组与对照组和假手术组的BDNF mRNA表达(第21—28d)相比差异有显著意义(P<0.05), 但对对照组与假手术组相比无显著性意义(P>0.05)。结论: BDNF参与了脑出血后神经可塑性的发生, 运动训练可促进BDNF基因及其蛋白表达, 从而改善神经功能。

关键词: [运动训练](#) [脑出血](#) [脑源性神经营养因子](#) [免疫组化](#) [反转录-聚合酶链式反应](#) [神经可塑性](#)

The effects of exercises on expressions of BDNF and BDNF mRNA after ICH in rats [Download Fulltext](#)

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Abstract:

Objective: To investigate the effects of physical exercises on the expression of BDNF(brain-derived neurotrophic factor) and BDNF mRNA of neurons after ICH in rats. Method: A total 120 male SD rats(weight, 270 to 300g) were divided into three groups, trial group (ICH-induction and exercises group, n=40), control group(ICH-induction without exercises group, n=40) and sham-operation group (no operation, without ICH and exercises, n=40). The brains of rats were removed at the 7th d, 14th d, 21th d, 28th d after ICH respectively. The other 35 rats were divided into five groups for testing the BDNF changes at the 6th h, 12th h, 24th h, 48th h and 72nd h after ICH. The sham group and control group were randomly assigned at the same time (operated and normal). The activation of BDNF protein was measured with immunohistochemistry technology and BDNF mRNA was tested with RT-PCR. The rats in trial group started cage-running exercises at the 72th h after ICH. The others lived in standard cages. Result: ①BDNF-positive neurons appeared around hematoma and cerebral cortex. The number of BDNF-positive cells was very little in sham-operation group. There was an up-regulation of BDNF at the 12th h after ICH, then it returned to normal at the 72th h after ICH. The expression of BDNF had an up-regulation trend in trial group and control group, and there was a significant difference compared with sham operation group (P<0.05). But trial group had a higher level than control group (P<0.05). ②The result of RT-PCR for BDNF-mRNA: The trial group had a higher level than control group and sham operation groups, there was a significant difference at the 21st—28th d(P<0.05). The control group had a higher level than sham operation group, but there was no significant difference (P>0.05). Conclusion: BDNF participate in neuron plasticity after ICH, and exercise training(cage-running) can clearly up-regulate the expressions of BDNF protein and BDNF-mRNA and improve neurological function.

Keywords: [exercise](#) [intracerebral hemorrhage](#) [rats](#) [brain-derived neurotrophic factor](#) [immunohistochemistry](#) [reverse transcription-polymerase chain reaction](#) [neuron plasticity](#)

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